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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,199	08/09/2001	Hossein Maleki	EN11190	4401

7590

01/13/2004

Motorola, Inc.  
Law Department  
8000 West Sunrise Boulevard -Room 1610  
Fort Lauderdale, FL 33322

EXAMINER
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YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 01/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/925,199

Applicant(s)

MALEKI ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**SYSTEM FOR ENHANCED LITHIUM-ION BATTERY PERFORMANCE**  
**AT LOW TEMPERATURES**

Examiner: Yuan

S.N. 09/925,199

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January 7, 2004

**Detailed Action**

1. The Applicant's amendment filed on June 30, 2003 was received. Claims 1,2,7 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (Paper No. 2).

***Claim Rejections - 35 USC § 112***

3. The claim rejections under 35 U.S.C. 112, second paragraph, on claim 1 are withdrawn, because the claim has been amended.

***Claim Rejections - 35 USC § 102***

4. Claims 1,3-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Hallaj et al. (U.S. 6,468,689 B1).

With respect to claim 1, Hallaj et al. teach a battery assembly comprising a battery module (10). The module comprises a plurality of electrochemical cells (14,16,18,20,22,24,26,28) as shown in Figure 1. The sleeve around the cells is a phase change material, generally designated by the reference numeral 34. Suitable phase change material for use in lithium-ion battery applications has a melting point in the range of between about 30° and

60°C, a high latent heat per unit mass ratio and a narrow melting temperature range. The phase change material permits the storage of heat for later or subsequent use or utilization. In particular, the stored heat can be rejected (transferred) when the battery temperature drops during battery charge or under cold weather conditions. Also, the heat absorbed by the phase change material at relatively high temperature can be conducted to the container (42). See Abstract; Column 3, Lines 53-62; Column 4, Lines 5-32. Hallaj et al. do not specifically disclose the phase change material acts as an insulator at relatively low temperatures and as a conductor at relatively high temperatures. However, it is the position of the examiner that such properties are inherent, given that both Hallaj et al. and the present application utilize the similar phase change material as the sleeve for lithium ion batteries. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 4, Hallaj reference teaches the electrochemical cells (14,16,18,20,22,24,26,28) can be lithium ion batteries.

With respect to claim 3, Hallaj reference teaches the sleeve around the cells is a phase change material.

With respect to claim 5, Hallaj et al. teach a battery assembly comprising a battery module (10). The module comprises a plurality of electrochemical cells (14,16,18,20,22,24,26,28) as shown in Figure 1. These cells are arranged in a close packing fashion within the module. The sleeve around the cells is a phase change material, generally designated by the reference numeral 34. Suitable phase change material for use in lithium-ion

battery applications has a melting point in the range of between about 30° and 60°C, a high latent heat per unit mass ratio and a narrow melting temperature range. The phase change material permits the storage of heat for later or subsequent use or utilization. In particular, the stored heat can be rejected when the battery temperature drops during battery charge or under cold weather conditions. See Abstract; Column 3, Lines 53-62; Column 4, Lines 5-32. Hallaj et al. do not specifically disclose the phase change material acts as an insulator at relatively low temperatures and as a conductor at relatively high temperatures. However, it is the position of the examiner that such properties are inherent, given that both Hallaj et al. and the present application utilize the similar phase change material as the sleeve for lithium ion batteries. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 6, Hallaj reference teaches the sleeve around the cells is a phase change material.

With respect to claim 7, Hallaj et al. teach a battery module (jacket) that accommodates a plurality of batteries. The module has a plurality of cavities that is complementary in shape to a battery. The sleeve around the cells is a phase change material, generally designated by the reference numeral 34. Suitable phase change material for use in lithium-ion battery applications has a melting point in the range of between about 30° and 60°C, a high latent heat per unit mass ratio and a narrow melting temperature range. The phase change material permits the storage of heat for later or subsequent use or utilization. In particular, the stored heat can be rejected when

the battery temperature drops during battery charge or under cold weather conditions. See Abstract; Column 3, Lines 53-62; Column 4, Lines 5-32. Hallaj et al. do not specifically disclose the phase change material acts as an insulator at relatively low temperatures and as a conductor at relatively high temperatures. However, it is the position of the examiner that such properties are inherent, given that both Hallaj et al. and the present application utilize the similar phase change material as the sleeve for lithium ion batteries. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

### ***Claim Rejections - 35 USC § 103***

5: The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hallaj et al. (U.S. 6,468,689 B1).

The disclosure of Hallaj et al. differs from Applicant's claims in that Hallaj et al. do not teach the phase change material can be replaced. However, it would have been obvious to one of ordinary skill in the art to have replaceable sleeve in the battery of Hallaj et al., because one of

ordinary skill in the battery art would recognize to replace the phase change material in the sleeve once they are spent or deteriorated after use.

7. Claims 7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salyer et al. (US 6,192,703 B1).

With respect to claim 7, Salyer et al. teach a highly insulated and light weight container (26). See Figure 3. The container (jacket) is useful for transporting the temperature-sensitive material to various remote areas comprising of a housing, a lid assembly and insulating vacuum panels. A thermal energy storage phase change material is used in the interior of the container and is in intimate contact with the temperature sensitive material (i.e., the phase change material defines a cavity) to maintain a constant temperature plateau. See Column 5, Lines 11-22. Salyer et al. do not specifically disclose the phase change material acts as an insulator at relatively low temperatures and as a conductor at relatively high temperatures. However, it is the position of the examiner that such properties are inherent, given that both Salyer et al. and the present application utilize the similar phase change material for temperature sensitive material, such as lithium ion batteries. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

The disclosure of Salyer et al. differs from Applicant's claims in that Salyer et al. do not teach the phase change material can be replaced. However, it would have been obvious to one of ordinary skill in the art to have replaceable sleeve in the container of Salyer et al., because one of

ordinary skill in the battery art would recognize to replace the phase change material in the sleeve (container) once they are spent or deteriorated after use. Also, one of ordinary skill in the art could purchase a new container to replace the original one if necessary, i.e., the sleeve is replaced.

With respect to claim 8, Salyer reference teaches the material employed in the container is a phase change material.

It is also the position of the examiner that the intended use “for a battery for facilitating battery use in various temperature environments” in the claim 7 does not add structure to the claim. Intended use of a known compound does not give it patentable weight. See *In re Thuau*, 57 USPQ 324, CCPA 979 135 F2d 344, 1943.

#### ***Allowable Subject Matter***

8. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 2 would be allowable because the closest prior arts of record, Hallaj and Salyer, do not disclose or suggest the material comprising an aluminum filled thermally conductive phase change material.

#### ***Response to Arguments***

9. Applicant’s arguments filed on June 30, 2003 have been fully considered but they are not persuasive.



*Applicant's principle arguments are*

*(a) the phase change material in Hallaj et al. is a thermal storage of latent heat, not a thermal conductor;*

*(b) the Hallaj reference must include a sealed container in the battery system;*

*(c) Salyer reference does not teach a sleeve shaped so as to define a cavity that is complementary in shape to a battery.*

In response to Applicant's arguments, please consider the following comments.

(a) Hallaj reference teaches the heat absorbed in the phase change material can be later rejected, i.e., the heat can be transferred to the surrounding environment if permitted. Moreover, the temperature rise in the sleeve would be ultimately transmitted via conduction or convection to the container and the ambient environment;

(b) the term "comprising" in claim 1 is an open language, which could comprise additional components in the battery;

(c) the term "sleeve" is understood as "an open-ended flat or tubular packaging or cover" according to Merriam Webster's Collegiate Dictionary, 10<sup>th</sup> edition. Salyer et al. teach an open-ended tubular packaging container (Figure 3), which can contain batteries commensurate with the size of the cavity in the container.

*Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295.

The examiner can normally be reached on Monday-Friday (8:00-5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and After Final communications.

Dah-Wei D. Yuan  
January 8, 2004

  
Patrick J. Ryan  
Supervisory Patent Examiner  
Technology Center 1700